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Australia exported also large amounts. In Austria-Hungary, imports diminished from \$10,950,000 in 1879, to \$8,000,000 in 1887, while exports increased from \$20,750,000 to \$33,900,000. In the United States, imports increased from \$7,100,000 in 1879, to \$16,650,000 in 1887, while exports decreased from \$128,800,000 to \$112,600,000. Importations into Belgium decreased from \$16,400,000 in 1879, to \$10,400,000 in 1887; in Italy, from \$21,200,000 to \$14,000,000; in Russia, from \$18,330,000 to \$10,400,000. By adding the above figures, it is found that the entire imports of meat into the countries specified have diminished from \$490,970,000 to \$403,120,000, while the entire exports decreased from \$278,180,000 to \$244,700,000. In 1875, Germany possessed 24,400,000 neat-cattle (four small cattle, such as sheep, hogs, and goats, being reckoned as one); in 1883, only 23,500,000. Between 1881 and 1887 there was in France an increase from 19,700,000 to 20,750,000; in Great Britain, from 17,800,000 to 18,600,000; while in Austria-Hungary the figures remained the same. The increase in population in these countries during this time was as follows: in Germany, 3,500,000; France, 480,000; Great Britain, about 3,000,000; and Austria-Hungary, 2,000,000. The ratio in France on account of the small increase of population is most favorable. This country, therefore, could increase its exports, says the United States commercial agent. In Germany the ratio is very bad, the number of neat-cattle having diminished 900,000 head, and the population having increased 3,500,000. It is most remarkable in the case of the United States, where imports increased 130 per cent, and exports diminished 12½ per cent, although the number of neat-cattle increased from 56,600,000 head in 1880, to 71,200,000 in 1888, and the population increased only from 50,500,000 to 62,000,000.

#### STANLEY'S EXPLORATIONS.<sup>1</sup>

I REMEMBER, while standing on the edge of the plateau which overlooks the southern end of Lake Albert, in December, 1887, that looking across the lake to the Unyoro plateau, and running my eye along its unbroken outline from north to south, I was much struck by the gradual but steady uplift of the land to a point near the lake's end, where a wide cleft separated the plateau from the disjointed mass and higher elevations culminating around Mount Ajif. Southward beyond Ajif we could see nothing but dark impenetrable clouds, ominous of a storm; yet underneath these night-black clouds lurked a most interesting mystery,—that of the long-lost and wandering Mountains of the Moon. Little did we imagine it, but the results of our journey from the Albert Nyanza to Unyampaka, where I turned away from the newly discovered lake in 1876, establish beyond a doubt that the snowy mountain which bears the native name of Ruwenzori or Ruwenjura is identical with what the ancients called "Mountains of the Moon."

Note what Scheaddeddim, an Arab geographer of the fifteenth century, writes: "From the Mountains of the Moon the Egyptian Nile takes its rise. It cuts horizontally the equator in its course north. Many rivers come from this mountain and unite in a great lake. From this lake comes the Nile, the most beautiful and greatest of the rivers of all the earth."

If, adopting the quaint style and brevity of the Arab writer, we would write of this matter now, we would say, "From Ruwenzori, the Snow Mountain, the western branch of the Upper Nile takes its rise. Many rivers come from this mountain, and, uniting in the Semliki River, empty into a great lake, named by its discoverer the Albert Nyanza. From this lake, which also receives the eastern branch of the Upper Nile, issues the true Nile, one of the most famous of the rivers of all the earth."

But this is a matter of slight moment compared to the positive knowledge that in the least-suspected part of Africa there has shot up into view and fact a lofty range of mountains, the central portion of which is covered with perpetual snow, which supplies a lake to the south of the equator, and pours, besides, scores of sweet-water streams to the large tributary feeding the Albert Nyanza from the south.

You will remember that Samuel Baker, in 1864, reported the

<sup>1</sup> Letter from Mr. Henry M. Stanley to the Royal Geographical Society of London and to the Royal Scottish Geographical Society, written from Camp at Kizinga Uzinya, Aug. 17, 1889.

Albert Nyanza to stretch "illimitably" in a south-westerly direction from Vacovia; and that Gessi Pacha, who first circumnavigated that lake, and Mason Bey, who in 1877 made a more careful investigation of it, never even hinted at the existence of a snowy mountain in that neighborhood; nor did the two last travellers pay any attention to the Semliki River. I might even add that Emin Pacha, for years resident on or near Lake Albert, or Capt. Cassati, who for some months resided in Unyoro, never heard of any such remarkable object as a snowy mountain being in that region: therefore we may well call it an unsuspected part of Africa. Surely it was none of our purpose to discover it. It simply thrust itself direct in our homeward route, and, as it insisted on our following its base-line, we viewed it from all sides but the north-east. Only then could we depart from its neighborhood.

Surrounded as I am by the hourly wants of an expedition like this, I cannot command the time to write such a letter on this subject as I would wish. I must even content myself with allowing a few facts to fall into line for your leisurely consideration.

If you will draw a straight line from the debouchure of the Nile from Lake Albert, 230 geographical miles in a direction nearly south-west, magnetic, you will have measured the length of a broad line of subsidence, which is from 20 to 50 miles wide, that exists between 3° north latitude and 1° south latitude in the centre of the African continent. On the left of this great trough, looking northward of course, there is a continuous line of upland, rising from 1,000 to 3,000 feet above it. Its eastern face drops abruptly into the trough: the western side slopes gently to the Ituri and Lomva basins. To the right there is another line of upland. The most northerly section, 90 miles, rising from 1,000 to 3,000 along the trough, is the Unyoro plateau, whose western face almost precipitously falls into the trough, and whose eastern face slopes almost imperceptibly towards the Kafur. The central section, also 90 miles long, consists of Ruwenzori range, from 4,000 to 15,000 above the average level of the trough. The remaining section of upland, and the most southerly, is from 2,000 to 3,500 feet higher than the trough, and consists of the plateaus of Uhaiyana, Unyampaka, and Ankori.

The most northerly section of the line of subsidence, 90 miles in length, is occupied by the Albert Nyanza; the central section, also 90 miles, by the Semliki River valley; the southernmost portion, 50 miles long, by the plains and New Nyanza, which we have all agreed to name the Albert Edward Nyanza, in honor of the first British prince who has shown a decided interest in African geography.

You will observe, then, that the Semliki valley extends along the base of Ruwenzori range; that the northern and southern extremities or flanks of Ruwenzori have each a lake abreast of it; that the Semliki River runs from the upper to the lower lake in a zigzag course.

If you were to make a plan *in relief* of what has been described above, the first thing that would strike you would be, that what had been taken out of that abyss or trough had been heaped up in the enormous range; and if along its slope you were to channel out sixty-two streams emptying into this trough, and let the sides of the trough slope here and there sharply towards the centre, you would be impressed with the fact that Ruwenzori was slowly being washed into the place whence it came. However, all these are matters for geologists.

For months all Europeans on this expedition, before setting out on their journey towards Zanzibar from the Albert Lake, were exercised in their minds how Sir Samuel Baker, standing on a hill near Vacovia, five or six miles from the extremity of the Nyanza, could attach "illimitability" to such a short reach of water; but after rounding the Balegga Mountains, which form a group to the south of Kavalli, we suddenly came in view of the beginning of the Semliki valley, — a sight which caused officers to ask one another, "Have you seen the Nyanza?" and the female portion of the Egyptian following to break out into rapturous "Lu-lu-lus." Yet we were only four miles away from the valley, which was nearly white with its ripe grass, and which indeed resembled strongly the disturbed waters of a shallow lake.

This part of the Semliki valley, which extends from the lake south-westerly, is very level: for 30 miles it only attains to an alti-

tude of 50 feet above the lake. All this part can only recently have been formed ; say, the last few hundred years. In one of its crooked bends nearer the south-eastern range, we stumbled suddenly upon the Semliki River, with an impetuous volume, from 80 to 100 yards wide, and an average depth of 9 feet. Its continually crumbling banks of sandy loam rose about 6 feet above it. One glance at it revealed it to be a river weighted with fine sediment. When we experimented, we found a drinking-glass full of water contained nearly a teaspoonful of sediment. We need not wonder, then, that for miles the south end of Lake Albert is so shallow that it will scarcely float a row-boat.

Beyond the grassy portion of the valley, a few acacias begin to stud it, which, as we proceed south-westerly, become detached groves, then a continuous thin forest, until it reaches the dense and rank tropical forest, with tall trees joined together by giant creepers, and nourishing in its shade thick undergrowths. Every thing now begins to be sloppy wet ; leaves and branches glisten with dew ; weeping mosses cover stem, branch, and twig. The ground is soaked with moisture : a constant mist rises from the fermenting bosom of the forest. In the morning it covers the valley from end to end, and during the early hours, stratum after stratum rises, and, attracted by the greater drought along the slant of Ruwenzori slopes, drifts upwards until the summits of the highest mountains are reached, when it is gradually intensified until the white mist has become a storm-cloud, and discharges its burden of moisture amid bursts of thunder and copious showers.

The valley sensibly rises faster in the forest region than in the grassy part. Knolls and little rounded hills crop out, and the ground is much more uneven. Violent streams have ploughed deep ravines round about them, and have left long narrow ridges, scarcely a stride across at the summit, between two ravines a couple of hundred feet deep. At about 75 miles from the Albert Nyanza the valley has attained about 900 feet of altitude above it, and at this junction the forest region abruptly ends. The south-west angle of Ruwenzori is about east of this, and with the change of scene a change of climate occurs. We have left eternal verdure, and the ceaseless distillation of mist and humid vapors into rain, behind, and we now look upon grass ripe for the annual fire and general droughtiness. From this place the valley becomes like a level grassy plain until the Albert Edward Nyanza is reached.

The southernmost stretch of the Ruwenzori range projects like a promontory between two broad extents of the ancient bed of the Albert Edward. To avoid the long *détour*, we cross this hilly promontory in a south-easterly direction from the Semliki valley, and enter eastern Usongora, and are in a land as different from that at the north-western base of Ruwenzori as early summer is from mid-winter. As we continue easterly, we leave Ruwenzori on our left now, and the strangely configured Albert Edward Nyanza on our right. The broad plains which extend between were once covered by this lake. Indeed, for miles along its border there are breadths of far-reaching tongues of swamp penetrating inland. Streams of considerable volume pour through these plains toward the Nyanza from Ruwenzori, without benefiting the land in the least. Except for its covering of grass, — at this season withered and dried, — it might well be called a desert ; yet in former times, not very remote, the plains were thickly peopled. The *zeribas* of milk-weed, and dark circles of *Euphorbia*, wherein the shepherds herded their cattle by night, prove that, as well as the hundreds of cattle-dung mounds we come across. The raids of the Waganda and the Warasura have depopulated the land of the Wasongora, the former occupants, and have left only a miserable remnant, who subsist by doing work for the Warasura, their present masters.

From Usongora we enter Toro, the Albert Edward Nyanza being still on our right, and our course being now north-easterly, as though our purpose was to march to Lake Albert again. After about 20 miles' march, we turn east, leave the plains of the Albert Edward, and ascend to the uplands of Uhaiyana, which having gained, our course is south until we have passed Unyampaka, which I first saw in 1876.

South of Unyampaka stretches Ankori, a large country, and thickly peopled. The plains have an altitude of over 5,000 feet above the sea, but the mountains rise to as high as 6,400 feet. As

Ankori extends to the Alexandra Nile, we have the well-known land of Karagwé south of this river.

Since leaving the Albert Nyanza, between Kavalli and the Semliki River, we traversed the lands of the Wavira and Babegga. On crossing the Semliki, we entered the territory of the Awamba. When we gained the grassy terrace at the base of the Ruwenzori range, we travelled on the border-line between the Wakonju, who inhabit the lower slopes of Ruwenzori, and the Awamba, who inhabit the forest region of the Semliki valley. The Wakonju are the only people who dwell upon the mountains. They build their villages as high as 8,000 feet above the sea. In time of war — for the Warasura have invaded their country also — they retreat up to the neighborhood of the snows. They say that once fifty men took refuge right in the snow region, but it was so bitterly cold that only thirty returned to their homes. Since that time they have a dread of the upper regions of their mountains.

As far as the south-west angle of Ruwenzori, the slopes of the front line of hills are extensively cultivated. The fields of sweet-potatoes, millet, eleusine, and plantations of bananas, describe all kinds of squares, and attract the attention ; while between each separate settlement the wild banana thrives luxuriantly, growing at as high an altitude as the summits of the highest spurs, whereon the Wakonju have constructed their villages.

Though we were mutually hostile at first, and had several little skirmishes, we became at last acquainted with the Wakonju, and very firm, close friends. The common enemy were the Warasura ; and the flight of the Warasura, upon hearing of our advance, revealed to the Wakonju that they ought to be friends with all those who were supposed to be hostile to their oppressors. Hence we received goats, bananas, and native beer in abundance. Our loads were carried, guides furnished us, and every intelligence of the movements of the Wanyoro brought us. In their ardor to engage the foe, a band of them accompanied us across Usongora and Toro to the frontier of Uhaiyana.

South-west of Awamba, beyond the forest region of the Semliki valley, begins Usongora. This country occupies the plains bordering the north-west and north of Lake Albert Edward. The people are a fine race, but in no way differing from the finer types of men seen in Karagwé and Ankori, and the Wahuma shepherds of Uganda. Their food consists of milk and meat, the latter eaten raw or slightly warmed.

The Toro natives are a mixture of the higher class of Negroes, somewhat like the Waganda. They have become so amalgamated with the lower Wanyoro that we can find nothing distinctive. The same may be said of the Wahaiyana. What the royal families of these tribes may be, we can only imagine from having seen the rightful prince of Usongora in Ankori, who was as perfect a specimen of a pure Galla as could be found in Shoa. But you need not conclude from this that only the royal families possess fine features. These Ethiopic types are thickly spread among the Wahuma of these Central African uplands. Wherever we find a land that enjoys periods of peace, we find the Wahuma at home, with their herds ; and in looking at them one might fancy one's self transported from the midst of Abyssinia.

Ankori is a land which, because of its numbers and readiness to resistance, enjoys long terms of uninterrupted peace ; and here the Wahuma are more numerous than elsewhere. The royal family are Wahuma : the chiefs, and all the wealthier and more important people, are pure Wahuma. Their only occupation, besides warring when necessary, is breeding and tending cattle. The agricultural class consists of slaves ; at least, such is the term by which they are designated. The majority of the Wahuma can boast of features quite as regular, fine, and delicate as Europeans.

The countries to the south of the Albert Edward are still unexplored, and we have not heard much respecting them ; but what we have heard differs much from that which you find illustrated by that irregular sheet of water called Muta Nzige, in the "Dark Continent" map.

Ruanda bears the name of Unyavingi to the people of Ukonju, Usongora, and Ankori, and is a large compact country lying between the Alexandra Nile and the Kongo watershed to the west, and reaching to within one day's long march of the Albert Edward. It also overlaps a portion of the south-west side of that lake. The

people are described as being very warlike, and that no country, not even Uganda, could equal it in numbers or strength. The late queen has been succeeded by her son, Kigeri, who now governs.

Since the commencement of our march homewards from our camp at Kavalli, we have undergone remarkable vicissitudes of climate. From the temperate and enjoyable climate of the region west of Lake Albert, we descended to the hot-house atmosphere of the Semliki valley, at nearly 3,000 feet lower level. Night and day were equally oppressively warm and close, and one or two of us suffered greatly in consequence. The movement from the Semliki valley to the plains north of Lake Albert brought us to a dry but a hot land. The ground was baked hard; the grass was scorched; the sun, but for the everlasting thick haze, would have been intolerable; in addition to which, the water — except that from the Ruwenzori streams — was atrocious, and charged with nitre and organic corruption. The ascent to the eastern plateau was marked by an increase of cold and many an evil consequence, — fevers, colds, catarrhs, dysenteries, and paralysis. Several times we ascended to over 6,000 feet above the sea, to be punished with agues, which prostrated black and white by scores. In the early mornings, at this altitude, hoar-frost was common. Blackberries were common along the path in North-West Ankori, 5,200 feet above the sea-level.

On entering Uzinya, south-west corner of Lake Victoria, the health of all began to improve, and fevers became less common.

I have jotted these few remarks down very hastily. Whether it is from lack of wholesome food or not, I confess to feeling it an immense labor to sit down and write upon any subject. I do not agree with Shakspere when he says —

"Fat paunches have lean pates; and dainty bits  
    Make rich the ribs, but bankrupt quite the wits."

In our case, and I speak for all our officers as well as myself, "dainty bits" just now would brighten up our wits, for we suspect that our wits have strongly sympathized with the bodies' pains.

That you may know what the upper regions of Ruwenzori are like, I send you Lieut. Stairs's account of his ascent to a height of nearly 11,000 feet.

[Lieut. Stairs's account, written from Expedition Camp, June 8, 1889.]

I have the honor to present you with the following account of an attempt made by me to reach the snow-capped peaks of Ruwenzori: —

Early on the morning of the 6th of June, accompanied by some forty Zanzibaris, we made a start from the expedition's camp at the foot-hills of the range, crossed the stream close to camp, and commenced the ascent of the mountain.

With me I had two aneroids, which together we had previously noted and compared with a standard aneroid remaining in camp under your immediate observation; also a Fahrenheit thermometer.

For the first 900 feet above camp the climbing was fairly good, and our progress was greatly aided by a native track which led up to some huts on the hills. These huts we found to be of the ordinary circular type so common on the plains, but with the difference that bamboo was largely used in their interior construction. Here we found the food of the natives to be maize, bananas, and colocasia roots. On moving away from these huts, we soon left behind us the long rank grass, and entered a patch of low scrubby bush, intermixed with bracken and thorns, making the journey more difficult.

At 8.30 A.M. we came upon some more huts of the same type, and found that the natives had decamped from them some days previously. Here the barometer read 23".58 and 22".85; the thermometer, 75° F. On all sides of us we could see *Dracænas*, and here and there an occasional tree-fern and Mwab palm; and tangled in all shapes, on either side of the track, were masses of long bracken. The natives now appeared at different hill-tops and points near by, and did their best to frighten us back down the mountain by shouting and blowing horns. We, however, kept on our way up the slope, and in a short time they disappeared, and give us very little further trouble.

Of the forest plains, stretching far away below us, we could see nothing, owing to the thick haze that then obscured every thing. We were thus prevented from seeing the hills to the west and north-west.

At 10.30 A.M., after some sharp climbing, we reached the last settlement of the natives, which consisted of beans and colocasias, but no bananas. Here the barometer read 22".36; thermometer, 84° F. Beyond this settlement was a rough track leading up the spur to the forest. This we followed; but in many places, to get along at all, we had to crawl on our hands and knees, so steep were the slopes.

At 11 A.M. we reached this forest, and found it to be one of bamboos, at first open, and then getting denser as we ascended. We now noticed a complete and sudden change in the air from that we had just passed through. It became much cooler and more pure and refreshing, and all went along at a faster rate and with lighter hearts. Now that the Zanzibaris had come so far, they all appeared anxious to ascend as high as possible, and began to chaff each other as to who should bring down the biggest load of the "white stuff" on the top of the mountain.

At 12.40 P.M. we emerged from the bamboos, and sat down on a grassy spot to eat our lunch: barometers, 21".10 and 27 $\frac{95}{120}$ "; thermometer, 70° F. Ahead of us, and rising in one even slope, stood a peak, in altitude 1,200 feet higher than we were. This we now started to climb, and, after going up it a short distance, came upon the tree heaths. Some of these bushes must have been 20 feet high; and, as we had to cut our way foot by foot through them, our progress was necessarily slow, and very fatiguing to those ahead.

At 3.15 we halted among the heaths for a few moments to regain our breath. Here and there were patches of inferior bamboos, almost every stem having holes in it, made by some boring insect, and quite destroying its usefulness. Under foot was a thick spongy carpet of wet moss, and the heaths on all sides of us we noticed were covered with Old Man's Beard. We found great numbers of blue violets and lichens, and from this spot I brought away some specimens of plants for the Pacha to classify. A general feeling of cold dampness prevailed. In spite of our exertions in climbing, we all felt the cold mist very much. It is this continual mist clinging to the hill-tops that no doubt causes all the vegetation to be so heavily charged with moisture, and makes the ground under foot so wet and sloppy.

Shortly after 4 P.M. we halted among some high heaths for camp. Breaking down the largest bushes, we made rough shelters for ourselves, collected what firewood we could pick up, and in other ways made ready for the night. Firewood, however, was scarce, owing to the wood being so wet that it would not burn. In consequence of this, the lightly clad Zanzibaris felt the cold very much, though the altitude was only about 8,500 feet. On turning in, the thermometer registered 60° F. From camp I got a view of the peaks ahead, and it was now that I began to fear we should not be able to reach the snow. Ahead of us, lying directly in our path, were three enormous ravines. At the bottoms of at least two of these there was dense bush. Over these we should have to travel, and cut our way through the bush. It then would resolve itself into a question of time as to whether we could reach the summit or not. I determined to go on in the morning, and see exactly what difficulties lay before us, and, if these could be surmounted in a reasonable time, to go on as far as we possibly could.

On the morning of the 7th, selecting some of the best men, and sending the others down the mountain, we started off again upwards, the climbing being similar to that we experienced yesterday afternoon. The night had been bitterly cold, and some of the men complained of fever; but all were in good spirits, and quite ready to go on. About 10 A.M. we were stopped by the first of the ravines mentioned above. On looking at this, I saw that it would take a long time to cross, and there were ahead of it still two others. We now got our first glimpse of a snow-peak, distant about two and a half miles, and I judged it would take us still a day and a half to reach this the nearest snow. To attempt it, therefore, would only end disastrously, unprovided as we were with food, and some better clothing for at least two of the men.

I therefore decided to return, trusting all the time that at some future camp a better opportunity for making an ascent would present itself, and the summit be reached. Across this ravine was a bare, rocky peak, very clearly defined, and known to us as the south-west of the Twin Cones. The upper part of this was devoid of vegetation, the steep beds of rock only allowing a few grasses and heaths in one or two spots to exist.

The greatest altitude reached by us, after being worked out and all corrections applied, was 10,677 feet above the sea. The altitude of the snow-peak above this would probably be about 6,000 feet, making the mountain, say, 16,600 feet high. This, though, is not the highest peak in the Ruanzori cluster. With the aid of the field-glass, I could make out the form of the mountain-top perfectly. The extreme top of the peak is crowned with an irregular mass of jagged and precipitous rock, and has a distinct crater-like form. I could see, through a gap in the near side, a corresponding rim or edge on the farther, of the same formation and altitude. From this crown of rock, the big peak slopes to the eastward at a slope of about  $25^{\circ}$ , until shut out from view by an intervening peak; but to the west the slope is much steeper. Of the snow, the greater mass lay on that slope directly nearest us, covering the slope wherever its inclination was not too great. (The largest bed of snow would cover a space measuring about 600 by 300 feet, and of such depth that in only two spots did the black rock crop out above its surface. Smaller patches of snow extended well down into the ravine.) The height from the lowest snow to the summit of the peak would be about 1,200 feet or 1,000 feet. To the east-north-east our horizon was bounded by the spur, which, starting directly behind our main camp, and mounting abruptly, takes a curve in a horizontal plane, and centres on to the snow-peak. Again, that spur which lay south of us also radiated from the two highest peaks. This would seem to be the general form of the mountain; namely, that the large spurs radiate from the snow-peaks as a centre, and spread out to the plains below. This formation on the west side of the mountain would cause the streams to start from a centre, and flow on, gradually separating from each other, until they reach the plains below. There they turn to the west-north-west, or trace their courses along the bottom spurs of the range, and run into the Semliki River, and on to the Albert Nyanza. Of the second snow-peak which we had seen on former occasions, I could see nothing, owing to the Twin Cones intervening. This peak is merely the termination, I should think, of the snowy range, we saw when at Kavalli's, and has a greater elevation, if so, than the peak we endeavored to ascend. Many things go to show that the existence of these peaks is due to volcanic causes. The greatest proof that this is so lies in the numbers of conical peaks clustering round the central mass and on the western side. These minor cones have been formed by the central volcano getting blocked in its crater, owing to the pressure of its gases not being sufficient to throw out the rock and lava from its interior; and consequently the gases, seeking for weak spots, had burst through the earth's crust, and thus been the means of forming these minor cones that now exist. Of animal life on the mountain, we saw almost nothing. That game of some sort exists, is plain from the number of pitfalls we saw on the road-sides, and from the fact of our finding small nooses in the natives' huts, such as those used for taking ground game. We heard the cries of an ape in a ravine, and saw several dull grayish-brown birds like stonechats; but beyond these, nothing.

We have found blueberries and blackberries at an altitude of 10,000 feet and over, and I have been able to hand over to the Pacha some specimens for his collections, the generic names of which he has kindly given me, and which are attached below. That I could not manage to reach the snow, and bring back some as evidence of our work, I regret very much; but to have proceeded onwards to the mountain under the conditions in which we were situated, I felt would be worse than useless, and, though all of us were keen and ready to go on, I gave the order to return. I then read off the large aneroid, and found the hand stood at 19<sup>°</sup>.900. I set the index-pin directly opposite to the hand, and we started down hill. At 3 P.M. on the 7th I reached you, it having taken four hours and a half of marching from the Twin Cones. The following are the generic names of the plants collected by me.

Emin Pacha has kindly furnished them. 1. *Clematis*; 2. *Viola*; 3. *Hibiscus*; 4. *Impatiens*; 5. *Tephrosia*; 6. *Elycina*; 7. *Rubus*; 8. *Begonia*; 9. *Peucedanum*; 10. *Gnaphalium*; 11. *Helichrysum*; 12. *Senecio*; 13. *Sonchus*; 14. *Vaccinium*; 15. *Erica arborea*; 16. *Landolphia*; 17. *Heliotropium*; 18. *Lantana*; 19. *Moschosma*; 20. *Lissochilus*; 21. *Dracena*; 22. *Luzula*; 23. *Carex*; 24. *Anthesteria*; 25. *Adiantum*; 26. *Pellea*; 27. *Pteris aquilina*; 28. *Asplenium*; 29. *Aspidium*; 30. *Polypodium*; 31. *Lycopodium*; 32. *Selaginella*; 33. *Marchantia*; 34. *Parmelia*; 35. *Usnea*; 36. Tree fern; 37. One fern; 38. One *Polypodium*. The generic names of the last three are unknown.

#### PHONETICS.<sup>1</sup>

I CONGRATULATE the Modern Language Association on the establishment of a section which is as indispensable to language as the character of the Prince of Denmark is to the play of Hamlet. Language lives in sound; and the study of modern languages is the study of the spoken tongues.

I was honored by appointment to the presidency of this section, not in virtue of any linguistic attainments, but simply in recognition of my long and minute study of practical phonetics. At this the first meeting of our Phonetic Section, a few words on that subject will not, I trust, be unwelcome.

We constantly hear of the difficulty in pronouncing a foreign language, and especially of the difficulty of our own language to foreigners; but the reason of the difficulty has not been sufficiently recognized, namely, that learners have no initiatory phonetic training. They try to imitate speech in the mass; and they fail, because, after our earliest years, the faculty of imitation is no longer an instinct, as it is in childhood. The child unfailingly adjusts its organs of speech to the production of whatever sound it is accustomed to hear, and no difficulty is experienced in the process. The youth and the man cannot do so, however, because their organs are already set for the pronunciation of one class of sounds, and they cannot readily alter the adjustment to suit the production of other varieties; that is, they cannot form new sounds in the verbal combinations of speech, but (and this is the point I wish to bring out) they can, or they can be readily taught to, produce any sound by itself. This power is a prerequisite for the certain result of facility in combining the new sound with others as fluently as by a speaker "to the manner born;" for what is called combination is in reality merely rapid sequence.

I have known persons who had long been familiar with Welsh speakers, utterly unable to pronounce the sound of *ll* in a word, but they have been taught in a few seconds to give the element its true native effect, by itself, and, after brief exercise, to give it and an associated vowel the rapidity of sequence which is called combination. We all know speakers who cannot pronounce the English *w* in *we*; but we do not any of us know a single such speaker who cannot at once be made to pronounce the element by itself, and within a few minutes to give it and the succeeding vowel the necessary rapidity of sequence to convert *w-e* into *we*. On the same principle, the German *w*, which English imitators pronounce *v*, can be readily acquired as an elementary sound by any person, and then syllabically connected with vowels exactly as by native speakers.

The sound of *th* is another shibboleth to those who do not possess it in their vernacular. Habit and association have fixed the false method acquired in early undirected attempts, and the wretched mispronunciation is continued year after year. Yet this supposed difficult sound can be pronounced as an element almost at the first effort by any of these speakers, and its combination in syllables be afterwards mastered with certainty.

The only difficult part of English pronunciation is in the application of what is called "accent," which gives a definiteness and stress to some one out of any group of syllables, and a feebleness and indefiniteness to all the other syllables in the group. Accent (or syllabic light and shade) is the most marked characteristic of English utterance, and generally the last to be acquired by a foreigner; yet there is no real difficulty in mastering even this accent-

<sup>1</sup> Address by Dr. A. Melville Bell before the Modern Language Association, at the first session of the Phonetic Section.